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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR MAY 1935

Vol. II, No. 7 (Not for publication) July 1, 1935

FRUIT INSECT INVESTIGATIONS

Number of Angoumois grain moth eggs needed to start rearing cabinets for Trichogramma work.--Herbert Spencer, of the Albany, Ga., laboratory, has recently made a study of the number of *Sitotroga* eggs needed for a quick start in grain cabinets in preparation for mass rearing of *Trichogramma*. On January 16, two cabinets were filled with frames of grain in the usual manner, and in one 2,400,000 *Sitotroga* eggs were placed, half on the date stated and the other half 2 weeks later. In the other cabinet 4,800,000 eggs were placed in the same manner and on the same days. As soon as the moths became numerous enough they were collected separately from each cabinet every day and records were kept of the egg yields. It has been concluded from the results obtained thus far that 2,400,000 eggs is a more economical number to use in starting a cabinet than twice that number, and that a cabinet may be brought into full production in 35 days.

Emergence of Blastophaga psenes (L.).--New data on the caprifying insect was obtained by H. C. Donohoe, of the dried-fruit insect laboratory at Fresno, Calif., who recorded emergence by sexes from 4 lots of 15 caprifigs each. The caprifigs were of the mamme or overwintering crop, variety Roeding No. 3. Production of females averaged from 114 to 192 per fig and males emerged at an average rate of from 34 to 74 per fig. The records obtained indicate that, in approximate figures, each male made openings in 3 galls and fertilized 3 females.

MEXICAN FRUIT FLY CONTROL

Activities in May.--During the month the inspectors' time has been given to trapping, to collecting wild fruits and berries that might be hosts of any species of *Anastrepha*, and to checking groves for any fruits missed during the clean-up. Traps in operation totaled 8,816. There were 32,256 trap inspections made and 581 premises trapped. Adult *A. ludens* Loew trapped in the lower Rio Grande Valley area totaled 23. Three *A. ludens* were trapped in Laredo, 5 in Matamoros, and 1 in Reynosa. Four *A. serpentina* and 1 *A.* sp. "*X*" were trapped in May. This is the first time the two last-named species have been taken since January.

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DATE SCALE CONTROL

Recess in date scale clean-up.--With the advent of hot weather, clean-up work was discontinued until fall. The greater part of the clean-up work was done in 1929 and 1930, when thousands of palms in abandoned seedling plantings were dug out and destroyed and many more were pruned so that they could be inspected properly. There remained many palms difficult to inspect which, although of no immediate concern, might later develop infestations that would result in spread. These palms have been pruned or dug out during the course of the work by the inspection crew at times when inspection could not be made satisfactorily because of wind or other unfavorable weather conditions. This type of work has been completed in Arizona and little remains to be done in California. An inspection from ground and ladders of the infested block in the Reed Garden in the Imperial Valley and of all ornamental palms within a 2-mile radius of the Reed Garden was completed and no scale was found. Pruning and inspection from ground and ladders, with the exception of a small block of tall palms in the Middleton planting, has been completed in the Webb subdivision. Ground inspection was carried on in the Yuma area and no scale was found.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Hairy vetch Bruchus in the Carolinas.--J. S. Pinckney reports as follows: "In North Carolina Bruchus brachialis Fahr. begins emerging from hibernation the latter part of April. One adult was taken by sweeping on April 23, 1935. On May 14 this field was again visited and many adults were found. At this time volunteer vetch was beginning to develop pods, although cultivated vetch had not yet begun to produce them. The adults were active, flying about the vines and climbing over the blossoms in search of pods on which to oviposit. Results of an egg count on May 14 on 25 pods taken at random from volunteer vetch were as follows: Pods infested, 11; number of eggs, 20; maximum number of eggs on 1 pod, 4. The first hatched eggs were found in the field on May 20. As the length of the incubation period of the egg ranges from 5 to 11 days in the field, this would indicate that egg deposition was started in the first week of May. On June 8 eggs were still being laid, although the peak of deposition was reached in the last week of May. Of 50 pods examined on May 25, 45 were infested with 804 eggs, with a maximum of 42 eggs on 1 pod. Altogether 1,275 pods were examined, of which 1,024 were found infested, with a total of 7,314 eggs. Hatching was taking place extensively on June 8 and young larvae were entering the seed in large numbers. As many as 6 entrance holes have been observed in 1 seed. The larva enters the seed at any point, but the greatest number enter at the hilum or close to it."

Parasite fails to hibernate in eggs of velvetbean caterpillar.--G. W. Barber, New Haven, Conn., reports as follows: "During the month of October 1934 Anticarsia gemmatilis Hbn. had become very abundant in a late-planted field of soybeans in Washington County, Ga., and the larvae were defoliating plants in parts of the field. About the second week of October, however, Trichogramma minutum Riley had become abundant and prevented further damage. A large proportion of Anticarsia eggs deposited after October 15 were parasitized and by October 31, when the soybean leaves were falling, almost every leaf bore from one to several parasitized eggs. Examinations of the eggs borne by the soybean leaves showed that all of the parasites emerged during the warm days of November. It was also apparent that the adults of T. minutum were not hibernating in the soybean hay or crop remnants."

Straw worm infestation reduced in early variety of wheat at Birds Landing, Calif.--W. B. Cartwright, of the Sacramento, Calif., laboratory, reports as follows: "At the time of maximum flight of the summer generation of the wheat straw worm (Harmolita grandis Riley) on April 24, a variety of wheat called Sunset was fully headed and its culms were either maturing rapidly or were dead. The straw worm infestation in this wheat reached a low, for the wheat nursery, with 60 percent of the plants infested and a population of 88 larvae per 100 plants. For comparison, Bunyip, a variety about 2 weeks later in heading, had a 100-percent infestation of the plants and a population of 340 larvae per 100 plants. In contrast with this imperfect synchronization of plant growth and straw worm activity, Sunset was most receptive to attack by the wheat joint worm (Harmolita tritici Fitch), receiving a 72-percent plant infestation, as compared to no infestation in a late variety. The joint worm migration was computed to have occurred near the middle of April and about at the heading period of Sunset. Past observations have indicated only meager infestations in wheat varieties at Birds Landing, Sunset being the notable exception and the earliest maturing variety yet tested. Bunyip ranks next for joint worm infestation and likewise is second in earliness. Sunset was acceptable to the hessian fly emerging in March but was not acceptable to the supplementary generation in May. Bunyip was infested by both broods."

Wheat-rye hybrid not infested by straw worm or joint worm.--Mr. Cartwright also states that when grown under conditions favorable for high infestations of straw worm and joint worm, an amphidiploid wheat-rye hybrid remained uninfested in the nursery in 1935 at Birds Landing. It was 100 percent infested with hessian fly.

Grasshopper outbreak in San Luis Obispo County, Calif.--C. C. Wilson, Sacramento, reports: "The outbreak of the warrior grasshopper (Camnula pellucida Scudd.) and the valley grasshopper (Oedaleonotus enigma Scudd.), which extends over a 100-mile front, is well under control. More than 50 tons of bran bait has been used in an effort to prevent widespread migration into cultivated crops. Damage to grazing land has been severe, especially to areas adjacent to the egg beds of the warrior grasshopper. Bur clover and filaree have been severely damaged, the former being completely defoliated and the latter cut off by the grasshoppers at the nodes near the ground. Threatened damage to thousands of acres of beans is being stopped by the application of poisoned bait in adjacent areas. Approximately 40 S. E. R. A. men are assisting the ranchers in this work, under the direction of the agricultural commissioner, in an effort to reduce the grasshopper population to a point that will prevent such outbreaks for a number of years. This (1935) is the third successive year of grasshopper damage and, apparently, carries the heaviest population."

Effects of early cutting on alfalfa weevil.--Geo. I. Reeves, Salt Lake City, Utah, reports that an experiment to prevent weevil injury by clipping the first crop 2 weeks before the usual cutting time was carried out by the Bureau in cooperation with County Agent Fowler and The Rogue River Company at Medford, Oreg. An extraordinary kill of eggs and younger larvae was obtained. The practical results have not yet been ascertained.

Correction.--On page 4 of the June 1, 1935, News Letter (vol. 2, no. 6), in line 27 under the heading "Nemic parasite of corn ear worm discovered", "alfalfa weevil" should read "clover leaf weevil."

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Bacterial diseases among Japanese beetle larvae.--In connection with the studies of soil organisms attacking immature stages of the Japanese beetle, I. M. Hawley and S. R. Dutky, Moorestown, N. J., found that dead and diseased larvae found during the month of May at Haddonfield, N. J., constituted 12.8 percent of the total larvae in the surveyed area. A large percentage of the diseased larvae showed the muddy brown color characteristic of one type of disease found heretofore. Larvae affected by this disease turn a muddy brown color while they are still alive and active. Microscopic examinations showed the blood of these larvae to be loaded with bacterial spores. Attempts to culture the organism have so far been unsuccessful. Healthy larvae given injections of blood of diseased larvae did not turn the characteristic brown but a milky-white, a condition very closely resembling the "milky" disease which has been previously reported. The two diseases, while very similar, are not believed to be identical, because of the decided morphological differences in the sporangia of the causal organisms.

Stickers and spreaders for derris.--L. D. Goodhue, Moorestown, reporting on this work, gives in the following table the results of some new stickers tested on glass plates. The amount removed by washing was determined by weight. A 2-percent suspension with 1-percent sticker was used, except as indicated with the last combination.

Sticker	Percentage removed by washing
Sticky resin	5.6
Rosin residue, Type II	7.5
Rosin residue, Type I	7.5, 10.2
Rosin residue, Type III	8.5
Skimmed milk powder	82.5
Calcium carbonate, 2 percent Aluminum sulphate, 1 percent	97.8, 96.0

Type I rosin residue was tested at one-fourth the concentration of derris, and 13.8 percent was lost. This is a very effective sticker even at this low concentration.

Prevention of decomposition of derris by light.--Reporting further on the decomposition of derris, L. D. Goodhue gives in the following table the results of some new materials with additional tests on old ones as stabilizers for derris. Deposits on the glass plates have been examined under the microscope in an effort to explain the good results obtained with white pyroxylin enamel. With other substances a large part of the derris still remained exposed, while with white enamel nearly every particle was well coated. The enamel coated the derris more readily than the glass plate. The physical properties of this material during spraying and drying appear to be the explanation of the good results obtained.

Material added to derris	Percentage added [1]	Sticker [2]	Ratio of undecomposed derris to a mixture of derris and fish oil in	
			5 days	10 days
White pyroxylin enamel-	100	Pyroxylin	2.6	4.5
Titanium dioxide--------	100	Irish moss	2.3	1.2
Magnesium silicate-----	400	do.	2.1	1.3
Do-------------	200	do.	2.0	1.3
None-------------------	0	None	2.0	1.6
Do-------------------	0	Rosin residue III	2.0	1.6
Do-------------------	0	Rosin residue II	1.9	1.5
Do-------------------	0	None	1.9	1.8
Do-------------------	0	Rosin residue I	1.7	1.8
Sulphur-----------------	50	Casein	1.6	1.4
Whiting-----------------	200	Irish moss	1.6	1.2
Bentonite---------------	50	Casein	1.5	1.0
Titanium dioxide--------	100	Rosin residue I	1.5	---
Magnesium phosphate-----	100	None	1.2	1.3
Calcium carbonate-------	100	Rosin residue III	1.1	1.0
Calcium carbonate-------	100)	None	0.5	0.27
Aluminum sulphate-------	25)			

[1] Based on the amount of derris.

[2] Approximately 50 percent of weight of derris.

On the basis of these and similar tests, blown fish oil has been discarded and Type I rosin residue substituted as a sticker for derris to be tested in the field this season. Type I was chosen because of its lower viscosity which allows it to be more easily emulsified.

Protection of truck crops from injury by Japanese beetle larvae.--Tests were undertaken by F. E. Baker, Moorestown, to determine the effectiveness of a Danish roto-cultivator in reducing larval populations in the soil. A pasture in Shiloh, N. J., having a high concentration of larvae that were fairly uniformly distributed, was selected for the tests. Each trial was conducted on a 10-foot strip the entire length of the field, which was approximately 500 feet long. Preliminary surveys were made on 1 percent of the area by surveying 1 square foot every 10 feet, and the final surveys after plowing were made between the originals. The effectiveness of the Danish roto-cultivator in reducing larval infestations, as shown in the test runs made, is summarized in the following table:

Runs 3 inches deep	Runs 6 inches deep	Average larval infestation per square foot	Average survival per square foot	Survival
Number	Number			Percent
--	1	25.10 ± 1.95	7.66 ± 0.49	30.5 ± 3.1
--	2	29.44 ± 1.23	5.20 ± 0.37	17.7 ± 1.5
--	3	33.62 ± 1.85	2.02 ± 0.21	6.0 ± 0.7
1	1	30.70 ± 1.59	3.54 ± 0.50	11.5 ± 1.7
2	1	29.60 ± 1.78	2.40 ± 0.24	8.1 ± 0.9

It can be shown by statistics that running the machine twice over the same strip caused a significant decrease over 1 run, and the same decrease was true of 3 runs over 2 when the rotor was so set as to reach a depth of 6 inches in each case. In the same manner it can be shown that 1 plowing 3 inches deep followed by 1 plowing 6 inches deep gave a significantly greater reduction than did 2 plowings 6 inches deep. However, this reduction was still significantly less than was obtained from 3 plowings 6 inches deep. Although 2 plowings 3 inches deep followed by 1 plowing 6 inches deep apparently did not obtain quite as great a reduction as 3 plowings 6 inches deep, there was really no significant difference between the two. In order to compare the reductions attained with a rotary machine with those to be expected in the ordinary manner of preparing land for planting, 3 more tests were undertaken with a mold-board plow and a double disk. The effectiveness of the mold-board plow and the double disk in reducing larval infestations as shown in these tests is summarized in the following table.

Plowings 6-7 inches	Diskings	Average larval infestation per square foot	Average survival per square foot	Survival
Number	Number			Percent
1	1	24.74 ± 1.69	18.48 ± 1.39	74.7 ± 7.6
1	2	23.44 ± 1.61	16.18 ± 1.47	69.0 ± 7.9
1	3	23.84 ± 1.33	17.16 ± 1.09	72.0 ± 6.1

There was no significant difference between any of the tests made, showing that any disking immediately after plowing was of no value in reducing infestations of larvae at this time of year, when they are concentrated in the upper 2 inches in sod land. An average reduction of approximately 28 percent was obtained by the plowing. However, these tests definitely show how much more valuable rotary-type plows are than ordinary mold-board plows in reducing larval infestations.

Occurrence of Tiphia vernalis Rohw., an imported parasite of the Japanese beetle.--T. R. Gardner, Moorestown, reports that the first appearance of *T. vernalis* in the field was observed on May 7, when both males and females were found at the Philmont colony site at Philadelphia, Pa. Owing to the cold, wet weather early in May, this species was apparently retarded. Collections of adult females for colonization were not started until May 14 and were continued through May 24. During this period collections were made on 8 days. Collections were made from restricted points at well-established colonies located on the Philmont, Overbrook, and Roxborough golf courses. Two men were employed in collecting at Philmont; one man at Overbrook, except the last 2 days when two men were employed; and one man at Roxborough. During this 8-day period a total of 13,975 females were collected, divided as follows: Philmont, 8,506; Overbrook, 2,867; and Roxborough, 2,602. The total time spent in collecting was 188 man-hours, giving an average of nearly 75 females per hour per man, although at times when weather and temperature conditions were ideal one man collected 5 females per minute from one tree. When collections ceased on May 24, adult females were still abundant at the three collection centers and thousands more could have been collected. With this collected material, 133 colonies, each consisting of 100 females, have been placed in the field in the heavily infested areas in New Jersey, Pennsylvania, and Delaware by M. H. Brunson and R. T. White.

JAPANESE BEETLE CONTROL

Trapping started in St. Louis, Mo., and in the Carolinas.--Placing of Japanese beetle traps in St. Louis as a special E. R. A. project was begun on May 17. Traps set by the end of May numbered 2,500. With the dispatch to North and South Carolina of four trap-distributing crews from the New Cumberland, Pa., warehouse on May 29, the first field operations in connection with this season's trap-scouting program in the South were started. Eight trucks were loaded with 13,000 scouting-type traps to be used in the Carolinas. These are the first of the collapsible tin-plate traps to be set in the field. Under greatly modified specifications, it was possible this year to purchase geraniol at $0.54 per pound, as compared with previous purchases at approximately $1.50 per pound.

Grubs intercepted at road-patrol stations.--From the soil about the roots of contraband plant material surrendered at the road-inspection stations during May there were removed 45 Japanese beetle larvae. Among the most important infested shipments intercepted was a hydrangea plant en route from Washington, D. C., to Berryville, Va. Six larvae were found in the soil accompanying this plant. Five larvae were removed from the soil around the roots of 5 phlox plants obtained in Wilmington, Del., and destined to Greenville, S. C. A balled and burlapped dogwood tree originally obtained in Shiloh, N. J., and being transported by a motorist to Youngstown, Ohio, was found to be infested with 4 grubs. A south-bound motorist from Philadelphia, Pa., surrendered at the Fredericksburg, Va., station 2 peony plants that contained 3 larvae. Four grubs were found in the examination of soil accompanying a rose bush and 2 chrysanthemum plants obtained in Delaware City, Del., in the possession of a motorist bound for West Palm Beach, Fla.

In addition, 17 other infested lots of plants were stopped while on their way to various nonregulated points in West Virginia, Virginia, North and South Carolina, Tennessee, Georgia, Florida, Pennsylvania, Michigan, Minnesota, and Missouri.

Gypsy moth egg clusters removed from inspected commodities.--Products found infested in the course of the month's inspections included 300 cedar poles shipped by boat from Wickford, R. I., to New Haven, Conn. The inspector located and creosoted 25 egg clusters on these poles. While inspecting 4 spruce trees at a nursery near Framingham, Mass., 3 egg masses were found. Single egg clusters were removed from an azalea for shipment from Sandwich, Mass., to Evanston, Ill., and from a hemlock tree certified at a Westfield, Mass., nursery; and 75 egg clusters were found on 2 carloads of lumber presented for inspection and certification at Wescott, Maine, for shipment to Brooklyn, N. Y. Although the lumber was inspected from May 24 to 27, only 1 egg cluster had started to hatch. Four egg clusters were found on a carload of lumber destined from Meredith, N. H., to Brooklyn, N. Y.

Dutch elm disease activities halted.--With the practical exhaustion of the P. W. A. allotment of $527,000 for the sanitation project of the eradication program and in the absence of an anticipated further allotment from work relief funds, it was necessary on May 10 to dismiss all P. W. A. workers engaged in scouting and eradication. With elms just coming into full leaf the middle of May, the most desirable period of the year for observing conspicuous wilting caused by disease infection was approaching. Emergence of Hylurgopinus rufipes Eich. was reported on April 24, and Scolytus multistriatus Marsh. beetles were observed emerging on May 10. Except for 36 crews placed on the New York State payroll for 10 days beginning May 25 and 152 C. C. C. workers operating in the New Jersey area, the latter part of the month was one of complete inactivity insofar as elm eradication was concerned.

Summer symptoms of Dutch elm disease appear.--Culturing of samples collected from an elm in the Bronx, which on May 16 first evidenced characteristic wilting, resulted in confirmation of the infection as Dutch elm disease. Another tree some blocks from the first tree discovered was also confirmed as similarly infected. Four days after discovery of the first tree, wilting had progressed to practically all foliage and by June 1 wilting was complete. On June 1 six additional wilted elms, apparently characteristic of the Dutch elm disease, were sampled in the area infected in New York. Culture results of these are not yet available. Probabilities are that infected trees will now rapidly show themselves and can readily be picked up as soon as scouts can be placed in the field. Field observations in lower Westchester County, N. Y., show considerable canker-worm defoliation of elms. If this progresses to most of the elm trees, lack of foliage will seriously hamper scouting for the Dutch elm disease, as the defoliated branches will present a dormant, winter appearance.

FOREST INSECT INVESTIGATIONS

An oriental insect established in the New York area.--Among a large number of insects taken from elms infected by the Dutch elm disease and sent in by W. D. Buchanan, of the Morristown, N. J., laboratory, for identification, one lot was found by M. W. Blackman, of the Washington office, to comprise about 50 specimens of Xylosandrus (Xyleborus) germanus Blandf. These ambrosia beetles of the family Scolytidae were collected at East Orange, N. J., on May 6, 1934, where they were attacking the stumps of trees recently treated for Dutch elm disease. The trees had been cut and burned and the stumps had been barked and treated with oil. X. germanus occurs naturally in Japan, Formosa, and Chosen (Korea). In 1932 it was reported by E. P. Felt as having been found in a greenhouse in Oyster Bay, L. I. It apparently has now become established out of doors in the vicinity of New York City and has found our native elm a satisfactory host.

Pine beetle control successfully maintained.--According to F. P. Keen, of the Portland, Oreg., laboratory, a recent inspection of the white pine forests subject to damage by the mountain pine beetle in Mount Rainier National Park showed that the infestation on controlled areas had been practically eliminated.

Damage by ambrosia beetle forecast.--R. R. Furniss, Portland, reports that logging operators in the Douglas fir area of Oregon and Washington face the possibility of considerable losses during the current season from activity of ambrosia beetles. Labor disturbances have forced many concerns to leave large quantities of felled timber in the woods. Although no great loss has been experienced to date in the operations observed, it is certain that if the logs remain in the woods during warm summer weather losses will increase rapidly. Ambrosia beetle damage occurs very quickly during the summer months and since the select lumber grades are affected, damage is often heavy. One operator in Washington reported a loss of 25 percent from ambrosia beetle activity in 1934. As losses often occur under normal operating conditions, increased losses may be expected when the logs remain in the woods longer than usual. Initial attacks were noted this spring about the middle of April. The important lumber-producing trees and the species attacking them, as noted this year, are: Sitka spruce, attacked by Trypodendron bivittatum Kby.; western hemlock, by T. bivittatum and Gnathotrichus sulcatus Lec.; Douglas fir, by T. bivittatum, Gnathotrichus retusus Lec., and G. sulcatus.

Ochoco control project nears completion.--W. J. Buckhorn, of the Portland, Oreg., laboratory, reports that the western pine beetle control project on the Ochoco National Forest, which is being carried out by C. C. C. labor, is now nearing completion. Some 4,000 infested trees have been spotted and 3,461 trees had been treated when the work was inspected by Mr. Buckhorn during the latter part of the month. It is expected that the project will be completed by June 8.

Coeur d'Alene National Forest control project.--J. C. Evenden, of the Coeur d'Alene, Idaho, laboratory, reports that control measures were instituted on the Coeur d'Alene National Forest against the mountain pine beetle in white pine early in May. Although there are two N. I. R. A. camps operating on this project, most of the work is being done by C. C. C. laborers from four camps with trained personnel. The work is progressing smoothly and it is expected that the project will be finished by June 15.

Phenological data.--Mr. Evenden reports that a comparison of 4 years' phenological data taken at the Coeur d'Alene laboratory shows that the spring of 1935, although much later than that of 1934, is in reality very near normal. The spring of 1934 was exceedingly early. The following data show development of serviceberry flowers for 4 years, as well as the start of the pupal stage in Dendroctonus brevicomis Lec. In 1932 the serviceberry flowers unfolded on April 27; in 1933, on April 28; in 1934, on April 11; and in 1935, on May 3. In 1932 the pupal stage of overwintering broods of Dendroctonus brevicomis started on southern exposure on April 27; in 1933, on April 29; in 1934, on April 12; and in 1935, on May 2.

Mountain pine beetle in whitebark pine.--T. T. Terrell, Coeur d'Alene, reports that a small experimental control project against the mountain pine beetle in whitebark pine stands on Mount Washburn, Yellowstone National Park, proved rather successful. This project was instituted in 1934 to determine whether a successful reduction would follow artificial control on a limited area adjacent to other infestations. In 1934, 2,643 infested trees were cut and burned on a 5,000-acre area, and although there were other infested areas within a few miles, only 950 trees were attacked in 1934. This reduction of 64 percent shows that, although there was apparently some reinfestation from other infested areas, it is possible through the institution of control and maintenance work to protect an area of this character until the epidemic on adjacent areas dies down.

Oregon pine engraver beetle hibernates in litter.--J. A. Beal, of the Denver, Colo., laboratory, reports that late in April overwintering adults of the Oregon pine engraver (Ips oregoni Eich.) were found hibernating in large numbers in the litter and duff near infested trees and slash on the Harney National Forest, S. Dak. Some of the beetles had bored into old cones, cone scales, and small pieces of wood and twigs buried among the needles, but many of them remained free in the litter. They were inactive when found, but upon exposure to the warm rays of the sun quickly revived and became very active. A few beetles were found as far as 5 feet from the base of standing Ips-killed trees. It was evident that a majority of the beetles were hibernating in the litter and duff but, as some had already dispersed, no accurate estimate could be made. From the number of beetles still in the litter it was roughly estimated that more than 75 percent of the adults had overwintered in this situation.

Winter-killing of pine shoot moth.--J. V. Schaffner, Jr., of the Melrose Highlands, Mass., laboratory, reports that the extremely severe winter of 1933-34 followed by the cold winter of 1934-35 has resulted in tremendous reduction, possibly in extermination, of the European pine shoot moth (Rhyacionia buoliana Schiff.) in a planting of Scotch pine in Winchester, Mass. At Wakefield and at Lynn, Mass., the infestation still persists on Scotch pine shoots within 2 feet of the ground. At Lynn an ornamental planting of Mugho pine located near the seashore was found to be heavily infested. Mr. Schaffner also reports on an infestation of *Ellopia athasaria* Walk. at Warwick, Mass. The infestation is heavy over an area of about 10 acres and many hemlocks were severely defoliated in 1934. Random samples of leaf mold showed a population of approximately 4 pupae per square foot. Moths began issuing on May 24 and emergence has continued to the end of May. Three species of Amblytelini and one Pimplini have issued. One collection of 73 pupae was 27.4 percent parasitized and another, consisting of 167 pupae, was 22.7 percent parasitized.

Liberation of parasites of larch case bearer.--P. B. Dowden, Melrose Highlands, reports on the total issuance of parasites obtained from 200,000 hibernating larch case bearer larvae received from Hyéres, France. There were 15,307 *Chrysocharis laricinellae* Ratz. liberated as follows:

Date	Place	Chrysocharis liberated		
		Total	Males	Females
		Number	Number	Number
May 1----	Woodstock, Conn.	2,200	1,100	1,100
May 10----	do.	1,760	860	900
May 3----	Berlin, N. H.	4,038	2,001	2,037
May 8----	Sharon, Vt.	4,022	2,016	2,006
May 17----	Lempster, N. H.	1,775	1,100	675
May 22----	Winchester, Mass.	1,512	1,344	168
Total---	-------------------	15,307	8,421	6,886

Three other species of parasites were obtained, 419 *Cirrospilus vittatus* Walk., 674 *C. pictus* Nees, and 960 *Dicladocerus westwoodi* Steph. These species act as secondary parasites as well as primary and were not liberated. On May 21 a single specimen of *Chrysocharis* was collected at Woburn, Mass., in an infestation of *Kaliofenusa ulmi* Kieff. This has been determined by the Division of Identification and Classification as *Chrysocharis laricinellae*. As Woburn is more than 25 miles distant from the nearest locality where *C. laricinellae* has been liberated, this recovery indicates that the species may already be established in this country in certain localized areas although it has not yet been obtained from large collections of *Coleophora laricella* Hbn. and *Phyllotoma nemorata* Fall.

Elm leaf beetle parasites.--Mr. Dowden also reports that puparia of *Anachaetopsis nitidula* Rond. are being obtained from a shipment of approximately 25,000 hibernating elm leaf beetle adults received from H. L. Parker, Hyéres, France. Dissection has shown that the adult beetles are about 9 percent parasitized by this tachinid. The first puparium was noted on May 30 and 100 puparia were removed on May 31. This tachinid was liberated at Woburn, Mass., in 1934. Between May 6 and 17 over 10,000 elm leaf beetle adults were collected at this colony site for recovery of the parasite.

Liberation of pine shoot moth parasites.--Mr. Dowden and P. A. Berry report that 65 mated females of Ephialtes examinator Fab., which had successfully hibernated in the laboratory, were liberated on May 28 in an infestation of the pine shoot moth at New Vernon, N. J. On May 31 a colony consisting of 10,000 Tetrastichus turionum Hartig., a pupal parasite of the European pine shoot moth, was liberated at the same locality in New Vernon.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Forced spraying for gypsy moth in Pennsylvania.--Within the Pennsylvania infested area there are a number of heavily populated centers in which the individual property holdings are rather small, particularly in cities. Where spraying is necessary in such sections, signed permits for this work are obtained from the owners or the renters. In all instances where the owners or renters refuse to sign permits for spraying, a duly authorized agent of the State Department of Agriculture sends to each individual, in the name of the Secretary of Agriculture, a notice of treatment informing him that it is necessary for him to have all trees, shrubs, or woody plants on his premises thoroughly sprayed, to the satisfaction of the inspector of the Department, and that such treatment must be applied within 5 days of the date on which the notice is served. He is further notified that failure to apply the treatment, within the time specified, will make it necessary for the Department to apply the spray and he will be liable for the expense of such treatment.

Gypsy moth defoliation kills some trees.--Since the beginning of the new growing season it has been possible to determine the effect of last year's severe defoliation for some of the trees in areas stripped for the first time in the summer of 1934. This was particularly true of evergreens. Examinations, made in one area in the northwestern section of Worcester County, Mass., have shown that, in a considerable area stripped for the first time in 1934, 38 large hemlocks, some over 50 feet in height, were killed by 1 year's defoliation. In the same general locality many small pines, averaging about 5 feet in height, show marked evidence of severe damage. A sample plot, one-sixteenth acre in extent, contained 94 of these small pines and of these only one is in good condition at present. Nearly half are completely dead or show so few signs of life that they will probably die. With the exception of the one tree, which is in good condition, all others that show signs of life are very seriously injured. On another defoliated hillside in the same section, 43 pines, averaging about 30 feet in height, were killed by being defoliated last year.

C. W. A. work against brown-tail moth a success.--From recent reports, received from New Hampshire and Massachusetts, it is evident that the C. W. A. project for brown-tail moth extermination, conducted from December 1, 1933, to February 15, 1934, generally within the brown-tail-moth-infested area and continued by the State of New Hampshire until the end of March after the Federal project was discontinued, decreased degree of infestation to a marked extent. In Massachusetts, during the winter of 1934-35, 169,352 brown-tail moth webs were cut, in contrast to

328,310 cut under the C. W. A. project. In New Hampshire the difference is more marked, as, during the past winter, 1,548,287 were cut, whereas, under the C. W. A. project and State work, to the end of March 1934, 13,671,542 were cut and destroyed.

PLANT DISEASE CONTROL

Stem rust situation.--On June 4 E. C. Stakman reported that freezing temperatures in Texas on January 20 and 21 and again in February killed most of the rust-infected plants, so that little stem rust survived. Observations in April indicated only a trace of overwintering on wheat in Texas, and no stem rust was found at that time in Oklahoma. Overwintering apparently occurred in wheat fields in Mexico, but there was less rust this spring in northern Mexico than at the same time in 1934. General spread of stem rust on wheat began in the San Antonio, Tex., area after the middle of March, but infection did not appear on oats until later. By harvest time rust had caused severe losses in some fields of durum wheat near San Antonio, and an infection of from 34 to 40 percent had developed on common and durum wheats in Kerr, Kendall, and Gillespie Counties. In a considerable section of the North Central States, leaf rust overwintered abundantly on wheat.

Resurvey progress in barberry-infested areas in Wisconsin.--The figures given in the table below provide eradication data for comparison between the first and second inspections in the southeastern part of Dodge County, Wis., and in the territory around Lake Geneva.

Property no.	Eradication in 1929			Eradication in 1935		
	Bushes	Seedlings	Salt applied	Bushes	Seedlings	Salt applied
Dodge County	Number	Number	Pounds	Number	Number	Pounds
1	50	200	500	0	0	0
2	251	120	4,700	9	0	55
3	148	3,000	3,330	37	101	80
4	65	31	350	2	0	4
5	140	60	700	2	0	40
Total	654	3,411	9,580	50	101	179
Lake Geneva area						
1	17	--	56	1	--	1/
2	13	--	35	1	--	1/
3	17	--	25	5	--	5
4	351	185	300	266	--	100
Total	398	185	416	273	--	105

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Blister rust found on white pine in Wooster Arboretum in Ohio.--A specimen of diseased white pine from the Wooster Arboretum in Wayne County, Ohio, has been definitely identified as blister rust, which extends the range of this disease southward in Ohio by about 50 miles. The Wooster Arboretum is one of the finest in the Middle West and contains excellent plots of practically all white pines indigenous to the United States as well as several exotic species.

Eradication crews carry cartridge belts outfitted with chemicals for treating Ribes.--During a recent test of various chemical apparatus developed during the winter for use in blister rust control work in the West, it was found that cartridge belts outfitted with individual dosages of chemical could be used with complete satisfaction by eradication crews for treating occasional Ribes bushes that are abnormally difficult to eradicate by regular grubbing methods.

Treatment of diseased pines.--Several C. C. C. men in Pennsylvania were engaged during April on the treatment of diseased white pines in State plantations. The following results were obtained from this work: Estimated number of pines examined, 57,272; number of fatally infected pines cut down, 4,969; number of pines treated for infection, 24,934; number of cankers removed--branch, 41,591, stem, 5,053; man-days of labor, 620.

Many Ribes destroyed in Maryland.--During the month of May Ribes-eradication work in Maryland reached its crest for the year with a total of 224,674 wild and 664 cultivated Ribes removed from 8,208 acres. Thirty-two P. W. A. workers removed 87,021 of these bushes, and the remaining 138,317 Ribes were removed by 36 men from three C. C. C. camps.

COTTON INSECT INVESTIGATIONS

How beet armyworm damages cotton.--Observations were made on the feeding habits of the beet armyworm by A. J. Chapman, L. C. Fife, and H. S. Cavitt in the Big Bend district in Texas. They report: "The young cotton plants were attacked as soon as they appeared above ground. The first, second, and third instars fed almost entirely on the under side of the leaf, skeletonizing it, but the later instars fed on both sides and ate large circular holes through the leaf. During the day they usually fed in the shaded or protected situations, with many of the older larvae concealed beneath debris, clods, or leaves on the ground. When many larvae fed on a plant all of the leaves were entirely consumed. On many of the plants the stems were eaten just below the bottom leaf, causing the top to fall over. The stems of small plants with only two leaves were frequently cut off just above the soil surface, as by cutworms. On alfalfa, the leaves were skeletonized, causing the entire field to have a whitish appearance. In this locality L. exigua was observed to feed on alfalfa, beets, corn, chili, hegari, lettuce, onions, peas, turnips, Johnson grass, horse nettle, pigweed, careless weeds, and other weeds. Alfalfa, beets, and cotton seem to be the preferred host plants, then hegari, corn, and turnips. Attempts at control by dusting or spraying with calcium arsenate, poisoned-bran bait, and irrigation were not satisfactory. By June many of the larvae in the Big Bend were parasitized and a disease had appeared which was killing the larvae in large numbers and no further damage is expected this year.

Pink bollworm emergence.--A series of hibernation cages to determine the seasonal emergence, and also the effects of different environmental conditions on survival of the pink bollworm were installed last fall at Presidio, Tex. W. L. Owens, Jr., reports that 3.07 percent of the worms installed had emerged as moths by May 31. This is slightly below the average for the past 7 years. The peak of emergence this year came in April, which was much earlier than last year (May 8). The peak also occurred considerably before squares large enough to infest were present. The survival from larvae spinning free cocoons in the soil was very low and no moths emerged from 800 larvae in infested blooms.

Notes on cotton flea hoppers.--K. P. Ewing and R. L. McGarr report that hatching of flea hoppers in the hibernation cages at Port Lavaca, Tex., was apparently finished by May 16. The total number recorded this year was slightly more than last year, or 46,484 as compared to 44,085 in comparable cages in 1934. The migration from wild host plants to cotton is considerably later than last year, as shown by flight screens, field inspections, and sweeping records. Twelve flight screens caught the following numbers of hoppers during the past 3 years: In 1933, 615 in April and 1,990 in May; in 1934, 79 in April and 2,220 in May; and in 1935, 440 in April and 484 in May. For the week ended June 1 the catch was 116 flea hoppers, but this increased to 565 for the week ended June 8, indicating that heavy migration was in progress. In 1934 the heavy migration started during the second week of May following heavy rains. This year there was 5.33 inches of rain on June 3 and showers for several days, which again stimulated migration. In addition to the regular screens located 3 feet from the ground, two screen towers 24 feet high with screens located at heights of 6, 12, 18, and 24 feet were placed in operation. More flea hoppers were caught at the 24-foot level than at any other, although there was not much difference in the different levels. The delayed migration to cotton has enabled many early squares to form. Considerable numbers of nymphs that had bred on cotton were present by the middle of May and, with the influx from the early June migration, the population is expected to increase rapidly.

Cotton aphids.--F. F. Bondy and C. F. Rainwater, Florence, S. C., report more than usual damage to cotton by aphids along the Atlantic seaboard. In a limited survey made by Rainwater in May, five species of aphids were found on cotton. Three of these are subterranean and two aerial in habitat. Applications of 200 pounds per acre of each of the following substances were tried as control measures: Calcium cyanamid ; 5 percent nicotine sulphate and 95 percent lime; 1 part sodium cyanide and 20 parts lime; 1 part paradichlorobenzene and 20 parts lime. The materials were thoroughly mixed with the soil the day of planting. No injury to germination was observed, but the calcium-cyanamid plots showed severe injury to the seedling cotton. Weekly records are being made of the number of ant hills present in the plots.

Correction.--In the June 1, 1935, News Letter (vol. 2, no. 6), p. 13, in footnote 1 to table, for equal read and. Also in the third line below the table for cleanliness, etc., read how clean the cotton was picked.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Trap-plot cotton in the Big Bend area of Texas.--The trap-plot cotton in the Castolon section of the Big Bend began blooming the latter half of the month (May), and daily bloom collections were started on May 20. On this date the first infested bloom was found in one of the field-planted plots, and on May 22 in the other field-planted plot and in the stub plot. The two field plots were planted on approximately the same dates the past two seasons, but this season the cotton seems to be making much faster growth, and a larger number of worms is being found. The number of infested blooms in the Castolon plots also showed quite an increase during the first week in June. By the end of the coming month it should be possible to make some accurate comparison of the infestations for the past two seasons. The plot cotton is at least 2 weeks in advance of the commercial cotton in the Presidio section, and probably farther advanced in the Castolon section.

Pink bollworm control work in Florida.--The survey of the Key West group was completed about the middle of the month, and we now have accurate knowledge of the wild-cotton colonies on the mainland keys from Key Largo to and including Key West. The prospect of complete eradication of wild cotton in the above area now appears to be extremely favorable. On the west coast the recleaning was continued, and by the middle of the month practically all of Charlotte County had been covered. The only scouting done above Miami on the east coast was a hurried survey made in June and July 1932. The small colony near Grant was found as a result of information supplied by an individual at Key Largo. It has seemed advisable to make an intensive survey from Miami northward at least to the frost line, and this survey was begun about the middle of May.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Low strengths of rotenone highly toxic to larvae of imported cabbage worm, tests indicate.--C. B. Wisecup and J. P. Vinzant, of the Sanford, Fla., laboratory, report that in recent laboratory tests very low strengths of rotenone were effective in killing quarter-grown and half-grown larvae of the imported cabbage worm (Ascia rapae L.). In the process of conducting these tests a derris-root-powder suspension in water was applied to both surfaces of cabbage leaves, giving a uniform coverage of the spray material without the addition of a sticker or spreader. The larvae were exposed to the treated food for a 24-hour period and were then kept under observation for 4 days. The percentages of kill are shown in the following table.

Rotenone content	Kill of larvae	
	Quarter-grown	Half-grown
Percent	Percent	Percent
0.0057-----	98.3	96.6
0.0115-----	99.1	95.0
0.0230-----	99.1	97.7
0.0575-----	99.1	98.3

The experiment described above was enlarged to include a similar series of tests with the celery leaf tier (Phlyctaenia rubigalis Guen.). Derris proved ineffective as a toxic agent against this species, as the larvae showed no detrimental effects other than a slight hesitancy in feeding, thus corroborating previous laboratory tests in which it was demonstrated that insecticides containing rotenone are not effective against the celery leaf tier.

Pea weevils survive low winter temperatures at relatively high altitudes in Idaho.--In experiments designed to determine the survival of the pea weevil (Bruchus pisorum L.) at different altitudes on Moscow Mountain, near Moscow, Idaho, during the winter of 1934-35, T. A. Brindley, of the Moscow, Idaho, laboratory, reports that the pea weevils survived at altitudes up to and including 4,750 feet and that, in general, the winter survival was greater at the higher altitudes. In addition, the results of these experiments showed that winter survival was much higher near the ground, where the insects were protected by a heavy covering of snow, than above the snow level. The weevils in cages above the snow level failed to survive a minimum temperature of 21° below zero, whereas approximately 57 percent of the weevils below the snow level survived this temperature.

Promising results from trapping and burning adults of gulf wireworm.--K. L. Cockerham and O. T. Deen, of the Biloxi, Miss., laboratory, report that recent field tests in trapping and burning the adults of the gulf wireworm (Heteroderes laurentii Guer.) indicate that the percentage of beetles destroyed ranged from approximately 80 to 95 percent in two fields of Irish potatoes. In these tests the potato vines, together with the weeds growing in the fields, were raked into windrows immediately after the potato harvest. A large percentage of the total wireworm adults present in the field congregated under these windrows. Plant material in the windrows was burned after it became sufficiently dry to maintain a running fire, aided by applications of small quantities of kerosene. In general, these preliminary field tests indicated that this method may aid greatly in the control of the gulf wireworm, provided the treated fields are thoroughly cleaned of plant material by raking, so that there will be a minimum of hiding places for the beetles, except in the windrows. It appears that in clean fields and in dry weather a very large number of beetles can be killed with a minimum of effort by following this procedure of trapping and burning.

Males of two wireworm species in Pacific Northwest are capable of multiple mating.--C. E. Woodworth, of the Walla Walla, Wash., laboratory, reports that in recent laboratory tests to determine the question of multiple mating of male click beetles of the Pacific coast wireworm (Limonius (Pheletes) canus Lec.) and the sugar-beet wireworm (L. californicus Mann.), 75 percent of the males fertilized at least 2 females, 50 percent fertilized 3 females, and at least 25 percent fertilized 4 females. These results have an important bearing upon the question of whether trapping male click beetles is an effective means of reducing the population of these two destructive species of wireworms in the Pacific Northwest. Superficially, it appears that, although traps have been devised to collect large numbers of male beetles, the survivors would be capable of fertilizing the females in any given locality.

Surface-soil moisture essential for maximum effectiveness of mole cricket bait.--J. N. Tenhet, of the Sanford, Fla., laboratory, reports that in recent laboratory tests with poison baits for the mole crickets, Scapteriscus spp., it was shown very definitely that the mole crickets fed to a much greater extent on the bait if the surface soil was watered just prior to application. Under these circumstances approximately 62 percent of the mole crickets fed upon the bait, whereas when the soil surface was not watered, only 26 percent of the mole crickets fed on the wheat bran, which composed the principal constituent of the poisoned bait. A new technique has been developed whereby it can be readily determined whether mole crickets under observation have fed on a particular bait. The bait is dyed a bright red by means of a harmless food dye and is placed before the mole crickets late in the afternoon. Early the following morning the mole crickets are killed in a cyanide jar and the stomach contents are examined. The presence of bait in the stomach contents is easily revealed by the dyed food material. The principal species involved in these tests was S. acletus R. & H.

Cube-dust mixtures effective against striped flea beetle in Louisiana.--Norman Allen, of the Baton Rouge, La., laboratory, reports that in field experiments, dust mixtures composed of cube-root powder containing 1 percent rotenone, with equal parts of tobacco dust and 300-mesh dusting sulphur as diluents, have given excellent control of the striped flea beetle (Phyllotreta vittata Fab.), when applied thoroughly to young turnip and mustard plants at weekly intervals. In comparable tests the applications of pyrethrum-dust mixtures were ineffective at strengths ranging from 0.12 to 0.49 total pyrethrins, that would be practical for ordinary field use.

INSECTS AFFECTING MAN AND ANIMALS

Screw worm campaign launched in Southeast.--Upon completion of the organization of the field personnel, educational, control, and research work was started immediately in over 250 counties in the Southeastern States. The livestock owners in these counties are receiving benzol and pine tar oil free of charge for the treatment of their animals, Bureau representatives in the counties are holding meetings to demonstrate to the stockmen the proper methods to use in the treatment and care of infested animals and how to prevent screw-worm infestations, and pens and chutes are being built to facilitate the handling and treatment of infested livestock.

FOREIGN PARASITE INTRODUCTION

Pink bollworm parasites from Egypt.--H. D. Smith, of the Hyéres, France, laboratory, has recently forwarded a consignment of larvae of *Exeristes roborator* Fab. and pupae of *Elasmus* sp., reared from the pink bollworm in Egypt. The Egyptian strain of *E. roborator* is the most important of the pink bollworm parasites in that country and attacks the pink bollworm more readily and more extensively than it does the corn borer. It is hoped that it will be better adapted to Texas conditions than the European corn borer strain, on which work has been done for several years.

Fruit fly parasites to Egypt.--Late in May a second attempt was made to forward colonies of adult fruit fly parasites to Egypt. The first shipment in November 1934 by direct steamer from Hawaii westward resulted unsatisfactorily, owing to the long period in transit and to inadequate attention. The present shipment was sent by steamer to San Francisco, by air express to Camden, N. J., by steamer to Cherbourg, France, and by air express from Paris to Cairo. The total elapsed time in transit was less than 3 weeks. This material was assembled by O. C. McBride, of the Honolulu fruit fly laboratory, and the shipment was examined and repacked at the Japanese beetle laboratory at Moorestown, N. J.

Tiphia shipment from Japan.--On May 18 R. W. Burrell, of the Yokohama laboratory, forwarded a consignment of 3,500 adults of *Tiphia* sp., intended for colonization against *Serica* and *Autoserica*.

Parasite shipment to Poland.--On May 31 a consignment of 328 scoliid cocoons of the genera *Elis* and *Tiphia* was forwarded to M. Nunberg, of the Research Institute of State Forests, Warszawa, Wawelska, Poland. These were collected in Indiana in April by P. Luginbill, of the cereal and forage insects laboratory at La Fayette.

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--Twenty-four living larvae and 17 living pupae were taken on September 26, 1933, at New York in five peaches in baggage from France. It has now been possible to identify these definitely as the Mediterranean fruit fly. This fruit fly was intercepted previously in peach from France on October 9, 1928. A specimen of *Macroplax fasciatus* H. S. was found last January at Washington, D. C., with *Cistus* sp. seed in the mail from Turkey. Living and dead larvae of the Asiatic rice borer (*Chilo simplex* Butl.) arrived at New York in rice straw in cargo from Spain. Three living larvae of the pepper weevil (*Anthonomus eugenii* Cano) were taken at El Paso, Tex., in green chili peppers in cargo from Mexico. This weevil is recorded from southwestern United States. The mealybug *Pseudococcus galapagoensis* Morrison was intercepted at San Francisco on *Cereus* sp. in cargo from the Galapagos Islands. Ten living larvae of the yam weevil (*Palaeopus costicollis* Marsh.) arrived at Boston in yams in baggage from Jamaica. Living larvae of the tomato pinworm (*Gnorimoschema lycopersicella* Busck) were taken at New York in tomatoes in cargo from Cuba. This gelechiid is also recorded from California, Pennsylvania, the Bahamas, Hawaii, Mexico, and Peru. Two living pupae of *Plusia ni* Hbn. were found at New Orleans on cabbage leaves in stores from England. An adult of *Diabrotica tibialis* Jac. arrived last February at Baltimore, Md., with banana debris in cargo from Guatemala. A living adult of *Monotoma centralis* Sharp was intercepted at Brownsville, Tex., in a green bean in baggage from Mexico. Living specimens of *Monanthia monotropidia* Stal were taken at Philadelphia on bananas in cargo from Guatemala. Living adults of the West Indian sugarcane borer (*Metamasius hemipterus* L.) were intercepted at Mobile, Ala., on bananas in cargo from Honduras; at New Orleans with banana debris in cargo from Nicaragua; and at Seattle on bananas in cargo from Ecuador. This weevil is a serious pest to the stalks of cane and is liable to importation in seed cane.

Pathological interceptions of interest.--Several of the following plant disease organisms are new to our interception files, others were intercepted for the first time on the host named or from the country named: *Botrytis allii* Munn at Seattle on March 20, on onions from Japan; *Bremia lactucae* E. Regel at New York on April 23 on lettuce from Germany; *Ceratostomella* sp. at New York on March 20 on malanga root from Dominican Republic; *Cercospora apii* Fresen. at New York on April 19 on parsley from Spain; *C. neriella* Sacc. at New York on April 3 on oleander from Bermuda; *Chrysomyxa piperiana* (Arth.) Sacc. and Trott. at Seattle on May 10 on rhododendron from Canada; *Exobasidium vaccinii* (Fckl.) Wor. at Philadelphia on May 11 on azalea from Sweden; *Glomerella cingulata* (Ston.) Spauld. and Schrenk at Mobile on May 10 on apple from Tasmania; *Leptothyrium* sp. at Washington on March 15 on *Hura crepitans* seed from Venezuela; *Nectria* sp. (near *N. episphaeria* (Tode) Fr. but spores somewhat larger) at Norfolk on April 7 on an orange from Puerto Rico; *Peronospora parasitica* (Pers.) D. By. at Philadelphia on May 14 from Holland; *Pestalozzia* sp. at Boston on May 16 on *Sobralia* sp. (an orchid) on S. S. *Jacob Ruppert*, source unknown, perhaps picked up en route from Little America; *Phoma rostrupii* Sacc. at Philadelphia on May 15 on carrot from England; *Phoma* sp. at New York on May 10 on lettuce roots from Trinidad; *Phoma* sp. at Philadelphia on May 6 on a potato from Spain; *Phomopsis* sp., probably an undescribed species, at New York on April 22 on star-apple fruit from Puerto Rico; *Puccinia rubigo-vera tritici* (Eriks. and Henn.) Carl at New York on February 26 on wheat straw from Portugal; *Sclerotium bataticola* Taub. at New York on April 24 on melons from Chile; *Septoria* sp. (no species listed for North America on this host) at Baltimore on April 23 on *Acanthus* sp. from Dominican Republic; *Sphacelotheca panici-leucophaei* (Bref.) Clinton at New York on April 29 on *Trithacline* (*Valota*) *insularis* from Puerto Rico; *Sphaeronema* sp. (no species found reported on *Allium*, except interceptions) at Charleston on April 24 on onion from Spain; *Uromyces betae* (Pers.) Lev. at New York on Swiss chard from Spain.

Notes on nemas.--*Aphelenchoides* n. sp. was found in abundance in a husk tomato, *Physalis ixocarpa*, from Mexico intercepted at Mobile on May 18. The fruit was in bad condition but since *Oospora lactis parasitica* F. J. Pritchard and W. S. Porte was present also, it was not possible to determine the amount of damage done by the nema. According to an abstract in the Review of Applied Mycology 14:217, a destructive tuber rot of yams (*Dioscorea* sp.) in

Nigeria appears to be primarily due to the eelworm Hoplolaimus bradys Steiner and Le Hew. See the note at the bottom of page 21 of the June News Letter regarding a new species of Hoplolaimus in yam from Nigeria. It is doubted whether material of H. bradys was available in Nigeria, hence possibly the species reported on is not H. bradys but the undescribed species recently intercepted.

Name changed.--A Phoma intercepted on carrot from France on April 1 at Port Arthur (See June 1 News Letter, p. 21) and from England on May 15 at Philadelphia was determined as Phoma sanguinolenta Rostrup. According to J. A. Stevenson, this name was used by Grove for another species, making a change necessary. The species on carrot is now Phoma rostrupii Sacc.

Accidents will happen, even in smuggling.--The elderly lady just off the boat from Puerto Rico carefully hung her sweater and coat on the dock fence at New York and opened her baggage for inspection. The plant quarantine inspector removed five sapodillas from her suitcase and passed on. The elderly lady gathered up her luggage and also went on her way, apparently forgetful of her wraps. Another lady left the plant quarantine inspector at work on her things, grabbed the sweater and coat and would soon have had them in the hands of their owner at the gate but as she started with them a mango thumped to the dock. So the plant quarantine inspector took charge of the garments, finding two more mangoes and three sapodillas in a sweater sleeve with the cuff tied to form a bag. Three fruit fly larvae found in one of the mangoes were later determined as Anastrepha acidusa Walk.

DOMESTIC PLANT QUARANTINES

Elms from Dutch elm diseased area intercepted.--Three Chinese elms shipped from the area regulated under the Dutch elm disease quarantine to a point in Pennsylvania were intercepted by a transit inspector at Long Island City on May 27 and turned back to the shipper. This is the first violation of Quarantine No. 71 that has been discovered in transit inspection.

Phony peach disease control.--All commercial peach orchards in nine counties in northern Georgia were inspected in May. Growers furnished labor to dig up and remove all infected trees as located by the inspectors. Field activities are also under way or are to start in June, in cooperation with State inspectors, in Alabama, Mississippi, Louisiana, Arkansas, Tennessee, North Carolina, and South Carolina. Inspection will be made of commercial orchards and the environs of nurseries in all infected States. In addition to intensive inspection in the known infected commercial areas of Arkansas, Illinois, Missouri, Tennessee, North Carolina, and South Carolina, a general survey of other parts of these States will be made to determine whether the disease is present. Such a survey has also been started in Delaware and will be extended to the States of New Jersey, Maryland, Virginia, West Virginia, Ohio, Indiana, and Kentucky, none of which is known to be infected. In regions of light infection an intensive effort is being made to locate and eradicate infected trees in order to check the northward spread of the phony peach disease.

Citrus trifoliata destroyed in Texas.--Continued inspection for citrus canker has resulted in finding additional infections in Brazoria County, some of which are old infections on large trees. Owners are cooperating in the destruction of Citrus trifoliata and the State has hired laborers to assist State inspectors in digging up and burning infected trees, as well as all adjacent trees.

Citrus canker inspection in Louisiana.--An intensive tree-by-tree inspection in the commercial citrus area of Plaquemines Parish of southern Louisiana, approaching completion the middle of June, has resulted in finding no citrus canker.

Narcissus bulbs inspected in Texas.--In order to keep open the avenues of trade with other States and insure that clean bulbs are shipped, inspectors in Texas have arranged to conduct the same inspection service for narcissus bulbs as that formerly required under Federal Quarantine No. 62. No special regulations have been placed in that State, according to recent word from Texas officials.

CONTROL INVESTIGATIONS

Toxicity of rotenone and pyrethrins alone and in combination.--The results obtained by F. L. Campbell and W. N. Sullivan, Takoma Park, Md., by the turntable method, show that rotenone in alcholic solution is about 5 to 6 times as toxic as an alcoholic mixture of pyrethrins I and II in about equal proportions. There also appears to be a synergistic effect when rotenone and the pyrethrins are mixed in equal proportions.

Relative toxicity of pyrethrins I and II.--Tests by Messrs. Campbell and Sullivan against house flies showed a mixture of 94.5 percent pyrethrin I and 5.50 percent pyrethrin II to be about 2.5 times as toxic as pure pyrethrin II, a compound submitted by H. L. J. Haller and F. B. La Forge of the Insecticide Division.

BEE CULTURE

Oregon honey-plant study.--F. E. Todd, in charge of the Pacific States Bee Culture Field Laboratory, Davis, Calif., reports that a cooperative project outlining honey-plant observations, to cover several years, is now in progress between the laboratory and the Oregon Agricultural College. Studies were inaugurated by G. H. Vansell in the Umpqua, Hood, Willamette, and Rogue River fruit areas this season. Pears provided an abundant supply of pollen for the bees but the nectar had comparatively little attractiveness. Spray poisoning of bees is a phase of the pollination problem that often becomes acute, especially when a cover crop is used. Poisoning from vetches is current before any blossoms appear, because bees visit some of these plants for extra floral nectar.

Loss of bees from plant poisoning.--A serious loss of adult bees has been reported in the mountain sage ranges of Orange County, Calif. Examination of these bees fails to indicate any disease and the only other explanation is that the bees are obtaining either nectar or pollen from certain plant sources that are poisonous. Evidence is gradually accumulating that plant poisoning takes a much larger toll of bees than has heretofore been suspected.

Foulbrood-eradication program.--F. E. Todd reports that at one of the sessions of the Western Plant Quarantine Board, which met in Sacramento the week of May 20, much interest was shown over the possibility of a Federal program, financed with relief funds, for the eradication of American foulbrood. Practically all the States are short of funds for adequate inspection and would welcome Federal assistance. Careful estimates have been made of a Federal campaign to inspect all colonies in the United States and eradicate all diseased ones. Unfortunately, this is a type of work in which only a limited amount of relief labor can be used.

Pollen-reserve study.--C. L. Farrar, of the Intermountain States Bee Culture Field Laboratory, Laramie, Wyo., has just concluded a summation of the survey records of the pollen reserves of colonies in the hands of commercial beekeepers. He concludes that, considering conditions under which the survey records necessarily had to be taken and the uncontrolled limiting factors affecting judgment, apparently where 50 percent of the colonies tend to fall in line with controlled experiments on the influence of pollen reserves on the survival of overwintered colonies, the survey results may be fairly significant. Mr. Farrar says it seems safe to conclude that the average pollen reserves within the region in question are well below the optimum desired for successful wintering; therefore, any method of management designed to increase the pollen reserves would be beneficial to efficient wintering of bees in the intermountain region.

Decrease in claims on package bees.--Warren Whitcomb, Jr., in charge of the Southern States Bee Culture Field Laboratory, Baton Rouge, La., reports that the claims for loss of package bees during the present shipping season have been less than for any season since 1932. The cause of loss of bees during shipment has been narrowed down largely to two factors; namely, high temperature and poor ventilation. Both the shippers and the express agency have taken advantage of these findings, resulting in low losses during the current season.

Package-bee business benefits from marketing agreement.--Most of the shippers of package bees have been able to maintain their business on a paying basis through the operation of the marketing agreement and license. A number of shippers have expressed the urgent desire to do everything possible to retain the agreement and license, which have been beneficial to both the producer and the consumer.

Unusual strain of European foulbrood.--C. E. Burnside, of the Somerset, Md., laboratory, in connection with his diagnostic work, has run across an unusual case of Italian bees failing to clean up European foulbrood. It

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is well known that European foulbrood is primarily a disease of common black bees and hybrids. Requeening such colonies with Italian stock generally results in negligible losses from European foulbrood. This treatment, even followed with a queenless period, has failed completely for a Maine beekeeper whose bees are affected by what appears to be an unusually virulent strain of European foulbrood. Preliminary tests of this strain at the Bee Culture Laboratory confirm the statement that the strain is unusually virulent, and experiments are in progress to determine the effect of this strain on various races of bees.

Queen bee travels from Tahiti to Maryland in 17 days.--A Tahitian queen mailed at Tahiti on April 22 by E. L. Sechrist was received at Somerset, Md., on May 8 and was laying eggs by May 16.

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